UNITED STATES SPECIAL OPERATIONS COMMAND
15.1 Small Business Innovation Research (SBIR)
Proposal Submission Instructions

Introduction:

The United States Special Operations Command (USSOCOM) seeks small businesses with strong research and development capabilities to pursue and commercialize technologies needed by Special Operations Forces (SOF). The USSOCOM Program Executive Officers (PEOs) submitted the topics to the USSOCOM SBIR Program Manager (PM) as topics that may transition to an acquisition Program of Record or Concept of Operation. In turn, the USSOCOM SBIR PM submitted the topics to the Department of Defense (DoD) for the DoD 15.1 SBIR solicitation.

A thorough reading of the "U.S. Department of Defense Small Business Innovation Research (SBIR) Program: Program Solicitation FY 15.1" prior to reading these USSOCOM instructions is highly recommended. These USSOCOM instructions are additive to the DoD guidance; i.e., designed to tailor or enhance certain aspects of the solicitation to meet or explain certain unique aspects of the USSOCOM SBIR program.

Contact with USSOCOM:

During the pre-release period of this DoD 15.1 SBIR solicitation, any technical inquiries must be submitted in writing through sbir@socom.mil, rather than made directly to the topic authors as specified in Section 4.15.c. of the DoD 15.1 SBIR Program Solicitation instructions. All inquiries must include the topic number in the subject line of the e-mail. During the solicitation open period, all questions must be submitted through the SBIR Interactive Topic Information System (SITIS) at www.dodsbir.net/SITIS. See Section 4.15.d of the DoD 15.1 SBIR Program Solicitation instructions for additional information on SITIS. During the source selection period, e-mail is the only method of communication that will be used by the Government Contracting Officer to notify the submitter/proposer if they have or have not been selected for an award.

Site visits will not be permitted during the pre-release and open stages of the solicitation.

Phase I and Phase II Proposal Submission:

USSOCOM will only accept Phase I proposals for the topics included in this USSOCOM solicitation, and select and fund for a Phase I award only those proposals that are most likely to succeed in meeting a USSOCOM need.

Small business concerns awarded a Phase I contract may choose to submit a Phase II proposal not later than thirty (30) calendar days following the end of the Phase I contract. Submission of a Phase II proposal is not included as part of the Phase I contract.

Potential offerors shall submit all Phase I and Phase II proposals in accordance with the DoD Program Solicitation at www.dodsbir.net/solicitation. The Technical Volume submission, exclusive of the Company Commercialization Report and the Cost Proposal, shall not exceed 20 pages. Pages submitted in excess of the twenty (20) page limit will not be reviewed.

Offerors must complete the cost proposal using the Cost Proposal form posted on the USSOCOM section of the www.dodsbir.net/solicitation site. The Cost Proposal information (in PDF format) shall be appended to and submitted with the Technical Volume; however, it will not count toward the 20 page limit for the Technical Volume.

All proposal information must be received electronically via the DOD SBIR/STTR Submission site. To submit, proceed to http://www.dodsbir.net/submission. Once registered, a company must prepare (and update) their Company Commercialization Report Data, prepare (and edit) Proposal Cover Sheets, complete the Cost Proposal form, and upload corresponding Technical Proposal(s).

Paper copies will be deemed non-responsive and will not be considered. A complete electronic submission is required for proposal evaluation. An electronic signature is not required on the proposal. The DoD SBIR/STTR Submission site will present a confirmation page when a Technical Proposal file upload was received. The upload will be available for viewing on the site within an hour. It is in your best interest to review the upload to ensure the server received the complete, readable file.

For additional information about electronic proposal submission, including uploading your Technical Proposal, refer to the instructions in the solicitation and the on-line help area of the DoD SBIR/STTR Submission site, or call the DoD SBIR/STTR Help Desk at 1-866-SBIRHLP (1-866-724-7457).

All of the USSOCOM topics in the solicitation are UNCLASSIFIED, and only UNCLASSIFIED proposals will be accepted.

Phase I Evaluation: USSOCOM conducts a formal source selection process to determine which offerors should be awarded Phase I SBIR contracts. USSOCOM evaluates Phase I proposals using the evaluation criteria specified in Section 6.0 entitled "Phase I Evaluation Criteria" of the DoD 15.1 SBIR Solicitation.

Informal Feedback: A non-selected offeror shall make a written request for feedback within 30 calendar days of receipt of notification of non-selection. USSOCOM will provide informal feedback in lieu of a debriefing. USSOCOM will provide informal feedback within 30 calendar days of an offeror's written request. (These component-unique instructions are in accordance with paragraph 4.10, entitled "Debriefing", of the DoD 15.1 SBIR solicitation.)

Phase I Awards:

USSOCOM's SBIR Program is small compared to most other participating DoD Components and on average awards three Phase I contracts per topic. The maximum amount of SBIR funding for a Phase I award is $150,000 and the period of performance is typically six months. USSOCOM does not include options in the resulting Phase I SBIR contracts. Phase I SBIR contracts are Firm Fixed Price contracts.

Phase I Kick-Off and Out-Brief Meetings: USSOCOM conducts Kick-Off and Out-Brief meetings during the Phase I period of performance. Firms selected for a Phase I SBIR contract shall have the ability to participate in the Kick-Off and Out-Brief meetings via electronic media mutually agreed upon by the firm and the Contracting Officer Representative.

Phase II Evaluation:

Each contractor's Phase II proposal received will be assessed as an independent technology pursuit, and will be judged on (1) how well it meets USSOCOM requirements, and (2) considerations of programmatic risk. Factors to determine programmatic risk include but are not limited to:

- The contractor's performance during Phase I
- Scientific and technical merit and feasibility
- Contractor's Qualifications
- Commercialization potential (based on the Commercialization Achievement Index and the Business Plan the company submitted during Phase I)

Phase II Awards:

The timing of selection for a Phase II award will be dependent upon USSOCOM's current requirements and available resources.

A Phase II award typically has a period of performance between 12 to 24 months and an award amount of approximately $750,000 to $1,000,000. USSOCOM may elect to increase or decrease the Phase II award amount when it is deemed to be in its best interests. Proposals should be based on realistic cost and time estimates, and not on the maximum time (months) and dollars budgeted. In preparing the proposal, offerors should consider that USSOCOM's workload and operational tempo will preclude extensive access to Government and military personnel beyond established periodic reviews.

The Federal Acquisition Regulation mandate to compete federal procurements is satisfied during the Phase I source selection process. Only those companies awarded Phase I contracts are allowed to submit Phase II proposals.

USSOCOM considers each Phase I feasibility study as a separate and distinct study that does not compete against each other. The feasible solutions that result from the Phase I studies are considered technology options that can be applied when needed to solve SOF capability shortfalls. Phase I feasibility options not immediately pursued after the conclusion of Phase I may move forward to the Phase II demonstration effort to satisfy future capability shortfalls.

Technical Data Rights:

The "Small Business Innovation Research Program Policy Directive" (hereinafter "Directive") and various Public Laws provide for protection of SBIR data rights under SBIR Phase III awards. Per the Directive, a Phase III SBIR award is any work that derives from, extends or completes effort(s) performed under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. Thus, any contract or grant where the technology derives from, extends or completes a Phase I or a Phase II SBIR/STTR contract and is awarded to the company that was awarded the Phase I/II SBIR is a Phase III SBIR contract. This covers any contract/grant issued as a follow-on Phase III SBIR award or any contract/grant award issued as a result of a competitive process where the awardee was a SBIR company that developed the technology as a result of a Phase I or Phase II SBIR funding agreement. USSOCOM will give SBIR Phase III status to any award that falls within the above-mentioned description, to include according SBIR Data Rights to any noncommercial technical data and/or noncommercial computer software delivered in Phase III that was developed under SBIR Phase I or II funding documents.

All proprietary material should be clearly marked and will be held in strict confidence. Restrictive notices notwithstanding, proposals may be handled for administrative purposes by support contractor personnel who are bound by appropriate non-disclosure requirements. Additionally, input on technical aspects of the proposals may be solicited by USSOCOM from non-Government consultants and advisors who are bound by appropriate non-disclosure requirements. Non-Government personnel will not establish final assessments of risk, rate, or rank offerors' proposals. These advisors are expressly prohibited from competing for USSOCOM SBIR awards. All administrative support contractors,

consultants, and advisors having access to any proprietary data will certify that they will not disclose any information pertaining to this solicitation, including any submission, the identity of any submitters, or any other information relative to this solicitation; and shall certify that they have no financial interest in any submission. Submissions and information received in response to this solicitation constitutes the offeror's permission to disclose that information to administrative support contractors and non-Government consultants and advisors.

U.S. Citizen Status: As part of the Phase I proposal, the offeror shall verify the US citizen status of each employee who will participate in the technology effort.

Foreign Nationals (Foreign Citizens):

The definition of a foreign national is included in Section 3.4 of the DoD 15.1 SBIR Program Solicitation. Consistent with Section 5.4.c. (8) of the DoD 15.1 Program Solicitation, the offeror shall identify all foreign nationals expected to be involved with the USSOCOM Phase I or Phase II effort to include each foreign national's country of origin and level of involvement (identify specific tasks). The offeror shall identify all foreign nationals in the appropriate section of the proposal. The USSOCOM SBIR Program oftentimes pursues technologies that require companies to complete the DoD Contract Security Classification Specification (DD Form 254) to protect sensitive Government Furnished Property and Government Furnished Information during the Phase II period of performance.

The identification of foreign national involvement in a USSOCOM SBIR topic is needed to determine if a firm is ineligible for award on a USSOCOM topic that falls within the parameters of the United States Munitions List, Part 121 of the International Traffic in Arms Regulation (ITAR). A firm employing a foreign national(s) (as defined in paragraph 3.4 entitled "Foreign Nationals" of the DoD 15.1 SBIR Solicitation to work on a USSOCOM ITAR topic must possess an export license to receive a SBIR Phase I or Phase II contract.

USSOCOM SBIR Program Point of Contact: Inquiries concerning the USSOCOM SBIR Program should be addressed to sbir@socom.mil.

SOCOM SBIR 15.1 Topic Index

SOCOM SBIR 15.1 Topic Descriptions

SOCOM15-001 TITLE: Maritime Surface Search Phased Array for Combatant-Craft

TECHNOLOGY AREAS: Sensors, Electronics

ACQUISITION PROGRAM: Naval Special Warfare Combatant-Craft Assault, Heavy, and Medium Programs

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 5.4.c.(8) of the solicitation.

OBJECTIVE: The objective of this topic is to develop an innovative Surface Search Phased Array (SSPA) that can be deployed on combatant craft; can function in harsh maritime environments; and can detect, locate, track, and display the speed and bearing of maritime objects of interest (including maritime surface vessels, aircraft, and aids to navigation) while being Low Observable, Low Probability of Intercept, and Low Probability of Detection (LO/LPI/LPD) capable.

DESCRIPTION: Naval Special Warfare (NSW) needs a SSPA capability that is Low Observable, Low Probability of Intercept, and Low Probability of Detection (LO/LPI/LPD). The SSPA shall be minimally observable by ship navigational radars, coastal surveillance radars, and small boat type radars. As a guide to facilitate integration of the SSPA in NSW combatant craft, the SSPA must have roughly the same space, weight, and power requirements as the currently installed 4 kilowatt small boat navigation type radars (particulars can be found on Google). SSPA subsystems exposed to weather shall be marinized against heavy rain and sea spray and ruggedized to withstand vibration and mechanical shock caused by wave slams sustained while the craft is operating at 40 knots in 4 foot combined seas (which is roughly equivalent to accelerations of 10g's, 100 milliseconds, half sine wave), depending on where and how the system is mounted on the craft.

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraph entitled "Description." As a part of this feasibility study, the proposers shall address all viable overall system design options with respective specifications on space, weight, power, LO/LPI/LPD attributes, maritime surveillance and navigation capabilities, and notional operating protocol/procedures.

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all known options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on a NSW combatant-craft in a realistic environment.

PHASE III: This system could be used in a broad range of military applications where low observable attributes including LPI/LPD are needed (for example, in overseas medium threat environments). Drug Enforcement is a possible commercial application.

REFERENCES:
1. http://en.wikipedia.org/wiki/Passive_electronically_scanned_array and

2. http://en.wikipedia.org/wiki/Active_electronically_scanned_array

KEYWORDS: Sensors, Surveillance, Tracking, Radar, Phased Array, Surface Search

SOCOM15-002 TITLE: Mobile Tactical Computer Human Machine Interface (HMI) Enhancements

TECHNOLOGY AREAS: Information Systems, Human Systems

ACQUISITION PROGRAM: Combatant Craft Medium Mark 1 (Mk1)

OBJECTIVE: Develop an intuitive, configurable, easy-to-use Human Machine Interface (HMI) for use by Naval Special Warfare (NSW) surface combatant craft tactical computer operators that enables them to control vehicle/craft-specific applications in the presence of challenging, platform-induced motion conditions. Doing so will significantly enhance their ability to operate increasingly sophisticated on-craft computers and application-specific software.

DESCRIPTION: Operating conventional, desktop-style operating systems and applications aboard NSW surface combatant (high-speed planing) craft has proven extremely challenging due to the often violent and unpredictable platform motions (See Reference 1, Reference 9) encountered during typical missions where physical discomfort is often the only moderator against the high speed/sea-state-induced motions experienced. Open cockpit craft subject operators and equipment to rain and sea spray historically compromising "touch" type interfaces. A "mobile-enabled" HMI (incorporating an alternative Graphical User Interface [GUI]) that allows operators to effectively interact with the computer programs (application software) is badly needed. Current attempts to overcome mouse/trackball/keyboard deficiencies (for example, joystick/thumb controls) have proven marginally better primarily due to limitations with the underlying software/applications that are designed for use with traditional GUIs employing deep menus with small (point-and-click) "targets". This "desktop paradigm" is not conducive, and is often completely unusable, to effective computer operations in the presence of platform motions. In the last few years, many new mouse-alternative, "augmented reality" [See Reference 2] based methods (for example, Leap Motion [See Reference 3], Google Glass [See Reference 4], Oculus Rift [See Reference 5]) of computer control have emerged in the commercial marketplace. Identifying a suitable and effective HMI and associated software application interface design methodology is the primary objective of this innovative technology effort.

PHASE I: Conduct a comprehensive feasibility study to identify salient features of the ideal, mobile-enabled HMI solution and then research available (or future/emerging) technologies to determine their effectiveness ([See Reference 6], [See Reference 7]) against this objective in terms of interacting with a computer under the influence of extreme platform motions. The study should strongly consider the intent to develop/modify new/existing applications using technology-enabling features (e.g. alternative GUI) that will potentially be pursued in Phase II. This phase should not be constrained by the existing desktop, menu-driven, point-and-click design paradigm; however, a concept for incorporating equivalent features of the application should be presented as part of the study's conclusion. Also, it should not be presumed the operator and computer screen are "coupled" (for example, some platforms put operators and screens on the same shock-isolating structure [coupled], while others place only operators in shock-isolating seats while the screen is mounted to the hull structure), however, the study may recommend a preferred coupling design for future consideration. Due to heightened injury potential in this environment, operators wear lightweight (Kevlar) helmets. Therefore, any additional appendages worn on the head should strive to minimize any additional mass. Other considerations for the hardware include the ability to be used in potentially wet conditions by glove-wearing operators. The strength of the study's conclusion will be based on how convincingly the proposed solution addresses operator's inability to resolve (visually or otherwise) and select/execute computer software functions/commands while subject to extreme platform motions.

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all known options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the

innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Evolve the selected optimal Phase I recommended solution using a breadboard prototype HMI, along with development (or modification) of a representative (or existing) software application that employs the enabling features, e.g. alternative GUI. A primary objective of this Phase's output is to develop and demonstrate an engineered, non-traditional GUI that facilitates effective interaction with the mobile-enabled HMI in the presence of platform motions as described above. A secondary objective is to document the Application Programming Interface (API) required for the associated GUI such that it can be adapted to both the HMI hardware as well as the application software. A final objective should provide/document guidelines for assessing the feasibility or relative ease with which any given piece of existing application software may be modified to integrate the mobile-enabled HMI. The alternative GUI should be tailored to expose only those functions that are necessary, based on mission needs, so as to maximize usability in the midst of challenging environments and potentially high-tempo situations. A strong candidate for existing application adaptation is the function-rich, open-source, geo-mapping software FalconView [See Reference 8].

PHASE III: As a result of demonstrating the feasibility and effectiveness of a new, mobile-enabled HMI, the products and methods developed in Phase II of this SBIR will enable industry to begin wide-scale development and/or modification of new/existing application software for use aboard other surface combatant craft, as well as other ground-mobile platforms across USSOCOM/DoD that experience severe platform motions. The effects of widespread implementation of a new, mobile-enabled HMI could prove transformative for operators while "on-the-move" -- significantly leveraging platform capabilities and therefore combat/mission effectiveness. Additionally, use of mobile-enabled HMI technologies would have broad applicability for disabled persons who have difficulty with fine-motor skills – similar to the effect of being on a moving frame of reference.

REFERENCES:
[1]. The Simulation of Wave Slam Impulses to Evaluate Shock Mitigation Seats for High-Speed Planing Craft, Appendix A, Dr. Timothy W. Coats, Michael R. Riley

[2]. Augmented Reality, http://en.wikipedia.org/wiki/Augmented_reality

[3]. Leap Motion, Motion Control Sensor, http://en.wikipedia.org/wiki/Leap_Motion

[4]. Google Glass, http://en.wikipedia.org/wiki/Google_glass

[5]. Why eye tracking could make VR displays like the Oculus Rift Consumer-ready, http://tinyurl.com/lowl2fv

[6]. Accounting for User Familiarity in User Interfaces, http://tinyurl.com/ppvrkyh

[7]. Integrating Humans With and Within Complex Systems, Azad M. Madni, http://www.crosstalkonline.org/storage/issue-archives/2011/201105/201105-Madni.pdf

[8]. FalconView, https://www.falconview.org/trac/FalconView

[9]. Combat Craft 2012 11M RHIB, http://www.youtube.com/watch?v=mE_1fS1qNoY

KEYWORDS: Augmented Reality, Human-Machine Interface (HMI), GUI migration, interaction reengineering, wrapper, legacy interface, GUI toolkit, assistive technologies, abstract user-interface, composite application, GUI forest, GUI ripping, API migration, adapter pattern

SOCOM15-003 TITLE: Novel Approaches to Fully Digital Optical Solutions

TECHNOLOGY AREAS: Sensors, Electronics, Human Systems

ACQUISITION PROGRAM: Tactical Assault Light Operator Suit (TALOS)

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 5.4.c.(8) of the solicitation.

OBJECTIVE: Identify and develop novel approaches, designs, materials, and concepts to reduce latency in digital visual systems.

DESCRIPTION: Digital optical solutions currently have inherent latency due to the processing chain from optical capture with a lens to a display. While system latency in excess of 5 milliseconds is acceptable in most applications where an operator is seated, this threshold is too high for the TALOS application. Being able to move dynamically while processing a digital image of the environment will require a system latency of 1.2 milliseconds (Objective) current analog nodes provide, less than 5 milliseconds (Threshold). In addition to meeting system latency, there is an additional objective to image from daylight/interior lights to an interior room with lights out and doors closed (dynamic range and sensitivity). At a minimum, high definition imagery is needed over a binocular field of view. The end state digital optical solution involving optics, sensors, electronics, and display should be compatible with augmented reality implementations and data feeds.

PHASE I: Conduct a feasibility study to determine the optimum method/technology solution for a low latency digital visual solution for the TALOS operator. Notional information concerning TALOS can be found at the below referenced web sites.

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all known options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop and demonstrate a prototype digital visual design/concept/approach that meets the performance characteristics defined in the above paragraph entitled "Description". The prototype system will undergo both laboratory and limited user testing to assess its technology readiness, its ability to integrate with the mechanical and electrical sub-system components of the TALOS and ultimate utility for integration into the TALOS ensemble.

PHASE III: This technology is applicable to other than TALOS applications for Special Operations Forces (SOF) as well as for the Services. This technology could also be beneficial to civilian security forces and police.

REFERENCES:
1. https://talos.us/ and https://www.google.com

KEYWORDS: TALOS, electro-optical, virtual reality, ultra lightweight, novel concepts, night vision

SOCOM15-004 TITLE: Reduced Size, Weight, and Power, Enhanced Range Electro-Optical and Infrared Sensor Suites

TECHNOLOGY AREAS: Sensors, Electronics

ACQUISITION PROGRAM: Manned Intelligence, Surveillance, and Reconnaissance (ISR)

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 5.4.c.(8) of the solicitation.

OBJECTIVE: The objective of this effort is to innovatively combine emerging Electro-Optical and Infrared (EO/IR) sensor technologies into existing airborne ISR gimbals to provide enhanced range and resolution capabilities. The nominal goal is to demonstrate comparable (or higher) EO and IR Video - National Imagery Interpretation Rating Scale capability in a 15 inch turret using the 20 inch turret as a baseline from 10,000 to 20,000 feet Above Ground Level. (See the below "References" paragraph for a link that discusses National Imagery Interpretation Rating Scale).

DESCRIPTION: The size, weight, and power (SWaP) of mission systems on fixed-wing Intelligence, Surveillance and Reconnaissance (ISR) platforms directly impacts the range and endurance of those platforms. Likewise, miniaturized components in a given system enable increased mission flexibility through more capabilities for a given SWaP. One solution to increase range and enhance resolution on ISR platforms is to miniaturize, repackage and rearrange internal components of current 20 inch turrets in a 15 inch form factor turret. Another approach is to replace 15 inch sensor components (arrays, sensor materials, integrated electronics, etc.) with emerging technologies that have enhanced properties or remove the need for other components. A third approach may include adding components, or processing capability, that increases resolution/interpretability. Proposers should consider these possible solutions and all other solutions to determine what is in the art of the possible. (The current 15 inch and 20 inch sensor capabilities are described in the two links referenced below). Range and resolution enhancements are not limited to optics alone. They can also be achieved through innovative technology development in other areas. Examples include: electronics, mechanical gimbals, innovative hardware layouts, and real-time post-processing for image enhancement and compression/transmission.

PHASE I: Conduct a feasibility study of combining low SWaP components equivalent to the EO and IR ISR interpretabilities of the current 20 inch turret into a 15 inch turret configuration.

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all known options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop a prototype to demonstrate what was determined to be feasible during Phase I.

PHASE III: Law Enforcement, Homeland Security, Federal Disaster Areas, Border Surveillance, and Private Aviation Contractors.

REFERENCES:

1. http://www.wescam.com/index.php/products-services/airborne-surveillance-and-reconnaissance/mx-15/

2. http://www.wescam.com/index.php/products-services/airborne-surveillance-and-reconnaissance/mx-20/

3. http://www.gwg.nga.mil/misb/docs/rp/RP0901.pdf

KEYWORDS: Fixed-Wing, ISR, EO/IR, reduced SWaP, Turret

SOCOM15-005 TITLE: Small Lightweight Concealable Stabilization Device

TECHNOLOGY AREAS: Sensors, Electronics

ACQUISITION PROGRAM: Special Operations Laser Acquisition Markers/Imagers

OBJECTIVE: Develop an innovative stabilization device for laser target designators and imagers.

DESCRIPTION: Special Operations Forces (SOF) need an innovative exterior device to stabilize laser target designators allowing them to accurately range, mark and designate targets at distances greater than 2 kilometers. Current devices are limited by the operator's ability to steady the target designator. Additionally, SOF operators oftentimes don't carry current stabilization devices because it exceeds their weight and volume limitations. The purpose of this technology pursuit is to develop an external stabilization device for target designators that weighs less one pound, can be folded into a very small form factor allowing it to be concealable, and is rugged. The stabilization device will be used on target designators in Joint Tactical Air Controller Missions. The design of the stabilization device must allow the operator immediately use when it's detached from the uniform. The target designators to be stabilized can range from 2 to 15 pounds. A stabilization device is also needed for imagers/cameras. The above requirements for laser target designators apply to imagers/cameras. Examples of ways to stabilize laser target devices and imagers/cameras include, but are not limited to, tripods, bipods, and monopoles.

PHASE I: Conduct a feasibility study to determine what is in the art of the possible that satisfies the requirements specified in the above section entitled "Description".

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all known options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop and demonstrate a prototype that is determined to be the most feasible solution during the Phase I feasibility study.

PHASE III: Geolocation, Marking, Night Vision, Spotting Devices, Sniper Rifles.

REFERENCES:
1. Examples of laser target designators can be found on the internet.

KEYWORDS: Stabilization, Mount, Tripod, Bipod, Pole, Lightweight, Foldable

SOCOM15-006 TITLE: Team Short Range Day/Night Motion Sensors and Display System

TECHNOLOGY AREAS: Sensors, Electronics

ACQUISITION PROGRAM: Special Operations Forces Small Unit Dominance

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 5.4.c.(8) of the solicitation.

OBJECTIVE: Develop a lightweight, low cost, battery operated day/night camera with motion detection sensor capability that is emplaced forward and will enable the operator to detect and identify approaching personnel. Innovation should focus on achieving acceptable performance while minimizing cost, size, weight, and power.

DESCRIPTION: The focus of this technology pursuit is to develop a lightweight, low cost, battery operated day/night capable camera with a motion detection sensor that can be emplaced forward. The camera must be connected (by wire or wirelessly) to a small hand held display up to 100 meters (Threshold), 200 meters (Objective) away. The system must enable the operator to detect and identify approaching personnel during day or night in a 45 degree (Threshold), 60 degree (Objective) field of view at a range of 45 meters (Threshold), 75 meters (Objective). The system should include a remote sensor, connecting cable, and a command/display unit. The remote sensor must be hand emplaced and include a small day/night capable camera that is staring or scanning with a motion detector. The day/night camera must be waterproof and capable of identifying details of dress, weapons, and activity of the approaching personnel. The motion detector must trigger the display and turn on the camera. For wire solutions, a lightweight hardened cable should connect the remote sensor system to the display unit. The cable must provide power and commands to the camera. The cable must also provide power from the output of the camera motion sensor to the display unit. If a wireless solution is offered, a self-recharging battery must be installed on the sensor unit. The small handheld display unit must provide a selectable visual/audio alert from the motion detector. The control unit can turn the camera on/off or the detector can activate the camera. All components must be easily emplaced, camouflaged, weatherproofed, and harden from shock and impact.

PHASE I: Conduct a feasibility study to determine what is in the art of the possible that satisfies the requirements specified in the above section entitled "Description".

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all known options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop and demonstrate a prototype motion detection sensor prototype determined to be the most feasible solution during the Phase I feasibility study.

PHASE III: Civilian and law enforcement security applications.

REFERENCES:
1. Ottawa Land Mine Treaty.

KEYWORDS: Sensor, day/night camera, motion detector, small displays

SOCOM15-007 TITLE: Transferable Armor for Non Standard Commercial Vehicle (NSCV)

TECHNOLOGY AREAS: Ground/Sea Vehicles

ACQUISITION PROGRAM: Family of Special Operations Vehicle - Non Standard Commercial Vehicle

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 5.4.c.(8) of the solicitation.

OBJECTIVE: Provide a solution that allows for armor protection (of varying levels) that is easily transferable from one vehicle to another (for example: sedan to sedan; truck to truck) and maintain exterior and interior Original Equipment Manufacturer (OEM) vehicle appearance and functionality.

DESCRIPTION: The armor protection package (transparent and opaque armor) shall be transferable between like vehicles (for example: truck to truck, Sport Utility Vehicle (SUV) to SUV). It shall be easily installed and removed in 6 hours by 6 operators (Threshold), 4 hours by 2 operators (Objective). The armor package shall be "low visibility" in order to maintain exterior and interior OEM appearance and functionality. The armor package should not significantly degrade vehicle performance. Several different protection levels will be considered, but the focus is on current NSCV threats. Commercial vehicles are a staple of Special Operations activities. One reason a commercial vehicle is used is to blend in and not draw attention to itself. At the same time as remaining inconspicuous, it is necessary to include protection to allow the vehicle and Operators to engage in activity as needed to accomplish the mission. Traditional armor consists of individually formed plates attached together underneath the vehicle sheet metal. This method can lead to seams and joints where ballistic coverage may not be optimum. It can also add difficulty to making the vehicle look like its indigenous counterparts. This SBIR topic is seeking innovative transferable armor packages for NSCVs. The solution should be relatively low in cost and weight as compared to other commercially available materials (i.e.: Ultra High Hard, High Hard, Mild Steel, etc.). The objective goal is to demonstrate at least a 20% reduction in cost as compared to the current/standard armoring processes. The solution should allow for minimal visual detection of the armor package to an observer in close proximity of the vehicle. A light weight, minimally intrusive armor package would reduce vehicle durability concerns while maximizing vehicle interior space (i.e.: more room for occupants and equipment). The objective goal is to demonstrate a minimum of 20% reduction in weight as compared to the standard armor material detailed above.

PHASE I: Provide a detailed study showing how the proposed innovative transferable armor solution can be applied to a commercial vehicle, highlighting the manufacturing and installation processes and the system enhancements the armor solution will provide in terms of weight, space, cost, visual signature, threat performance, and functionality. Comparison of the proposed solution against current standard armoring solutions will be executed and documented to show the pros and cons of the innovative armor in a vehicle sized application.

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all known options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop a detailed design for an application of the proposed armor solution in a commercial vehicle, including drawings and Computer Aided Design. Install instructions will be created to illustrate that the solution can be retrofitted into a commercial vehicle. The contractor will produce and ballistically test armor coupons to validate that the new solution can meet NSCV threats. The contractor will acquire a NSCV equivalent vehicle, manufacture a full vehicle kit of armor and perform a full vehicle installation of the armor kit. All projected enhancements from Phase I shall be validated or updated in detail based on the actual results identified in Phase II to quantify in detail the benefits (and any impacts) of the new system.

PHASE III: The contractor will work with current NSCV manufacturers and incorporate armor into upcoming Special Operations Forces (SOF) NSCV. In addition, SOF may be able to use the technology on current vehicles. Commercially, a new armor solution with the benefits cited above would enable the SBIR contractor to partner with a current commercial armoring company that produces privately armored vehicles with similar goals as the SOF vehicles and allow for expanding offerings of armored solutions.

REFERENCES:
1. www.toyota.com and www.nissanusa.com for mid-size pick-up trucks, sport utility vehicles, vans, and sedans."

KEYWORDS: Non Standard Commercial Vehicle, Armor, Survivability, Transparent Armor, Opaque Armor, transferrable, reconfigurable